



# Benson relaxation is effective in reducing anxiety and menstrual pain intensity in high school students in Semarang city

Pawestri<sup>1,2\*</sup>, Esti Yunitasari<sup>1</sup>, Makhfudli<sup>1</sup>, Nursalam<sup>1</sup>, Edy Soesanto<sup>2</sup>, Fitri Nur Chasanah<sup>2</sup>

<sup>1</sup>Nursing Department, Faculty of Nursing, Universitas Airlangga Surabaya, Indonesia

<sup>2</sup>Nursing Department, Faculty of Nursing and health, University Muhammadiyah Semarang, Indonesia

## Abstract

Limited knowledge among adolescents in managing dysmenorrhea often leads to anxiety, which may negatively affect their quality of life. Non-pharmacological interventions are needed to address both psychological and physical symptoms associated with dysmenorrhea. This study aimed to examine the effectiveness of Benson relaxation therapy in reducing anxiety levels and the intensity of dysmenorrhea among adolescents. A quasi-experimental study with a pretest-posttest control group design was conducted. The inclusion criteria were adolescents aged 15–18 years who experienced anxiety and menstrual pain. Anxiety levels were measured using the Depression Anxiety Stress Scale (DASS-42), while dysmenorrhea intensity was assessed using the Numeric Rating Scale (NRS). The implementation of Benson relaxation therapy followed the standard operating procedure proposed by Iwan (2020). The results showed a significant reduction in anxiety levels after the intervention, with the mean score decreasing from 14.38 to 6.68 ( $p = 0.001$ ). Similarly, the mean pain intensity decreased from 4.28 to 1.85, with the Wilcoxon test also indicating a statistically significant difference before and after the intervention ( $p = 0.001$ ). Benson relaxation therapy stimulates parasympathetic nervous system activity, promoting a state of relaxation that enhances comfort and helps individuals manage psychological and physical symptoms, including anxiety, fatigue, and pain. These findings suggest that Benson relaxation therapy is an effective non-pharmacological intervention for reducing anxiety and dysmenorrhea intensity among adolescents.

**Keywords:** Benson relaxation, Anxiety, Menstrual pain intensity

## Introduction

Menstruation is a periodic vaginal bleeding resulting from the shedding of the endometrial lining of the uterus. One of the issues that can arise during menstruation is dysmenorrhea (1). Dysmenorrhea refers to pain in the lower abdominal area extending to the pelvis, caused by the production of a chemical substance known as prostaglandin, which can exacerbate menstrual pain. Dysmenorrhea often causes discomfort for adolescents, and in some cases, it can disrupt their daily activities (2). Psychological factors that trigger dysmenorrhea include anxiety; an individual is considered anxious if they experience worry about uncertain matters, particularly among adolescents approaching menstruation (3). Many women feel anxious when they experience discomfort during dysmenorrhea. Adolescents suffering from dysmenorrhea may find their anxiety intensifying (4).

According to interview results from the study (4), efforts made by female students to alleviate

dysmenorrhea include applying warm compresses, consuming pain relief medications, drinking soy milk, and resting; however, some choose to endure the pain without any intervention. Another approach that has been implemented to reduce anxiety in adolescent girls experiencing dysmenorrhea is the combination of back massage and the recitation of the Quran, which has been shown to effectively decrease both pain and anxiety associated with dysmenorrhea (5). Based on research by Misliani (2019) and Misliani & Firdaus (2019), involving seven female students, it was found that 42.8% of students alleviated dysmenorrhea by bending their bodies and applying eucalyptus oil, 14.3% reduced dysmenorrhea simply by resting, another 14.3% reported that consuming herbal remedies such as turmeric and ginger during dysmenorrhea helped, and 28.6% of students took medications like Feminax to relieve their pain (6).

The incidence of dysmenorrhea worldwide is notably high, with an average of over 50% of women in every country experiencing this condition (7). In Indonesia, the occurrence of dysmenorrhea is reported to affect

107,673 women (64.25%), which includes 59,671 (54.89%) who suffer from primary dysmenorrhea and 9,496 individuals (9.36%) who experience secondary dysmenorrhea (8). In Central Java, there are 1,628,318 children, with 54.89% suffering from primary dysmenorrhea and 9.36% from secondary dysmenorrhea (Profil Kesehatan Jawa Tengah, 2021). The incidence of dysmenorrhea in Central Java reaches 56%, yet only a small percentage, approximately 1% - 2%, seek medical treatment, as dysmenorrhea is a natural occurrence that affects women monthly (Profil Kesehatan Jawa Tengah, 2021). According to data from the World Health Organization (WHO) in 2024, 4.4% of adolescents aged 10–14 years and 5.5% of those aged 15–19 years' experience anxiety disorders (10). The Indonesia National Adolescent Mental Health Survey (I-NAMHS) conducted in 2022 revealed that within the last 12 months, 15.5 million adolescents aged 10–17 in Indonesia suffered from mental health issues, including anxiety disorders (I-NAMHS, 2022). Research conducted by gambadauro (2025) indicates that among female adolescents experiencing dysmenorrhea studied at SMPN 09 Bathin Solapan, the majority reported mild anxiety, with 150 respondents (68.5%), while a minority experienced severe anxiety, totaling 69 respondents (31.5%) (11).

Previous research by Juwita (2023) identified a significant negative correlation between anxiety and dysmenorrhea among students at Universitas Malahayat (12). Several risk factors associated with the severity of dysmenorrhea include a younger age at menarche, irregular menstrual cycles, prolonged menstruation, obesity, poor nutrition, lack of physical activity, and a family history of dysmenorrhea (13). Moreover, anxiety is also recognized as a contributing factor to dysmenorrhea (Diana & Agustina, 2024). Adolescents who are unprepared to face menstruation may experience anxiety, leading to a lowered pain threshold, which ultimately exacerbates dysmenorrhea, resulting in more severe chronic and acute symptoms. Anxiety symptoms can manifest as physical (somatic) disorders, such as gastrointestinal issues, and menstrual pain may occur independently or in conjunction with other emotional disturbances (14). Teenagers experiencing anxiety or stress may have increased prostaglandin synthesis, accompanied by decreased levels of estrogen and progesterone, which in turn affects

blood flow to the uterine muscles and causes uterine ischemia, leading to dysmenorrhea (1). Most women suffering from dysmenorrhea also report experiencing nausea, vomiting, headaches, increased irritability, heightened emotional sensitivity, and fainting (15). Adolescent girls who experience menstrual cramps while studying and feel anxious during their studies may find their learning activities disrupted, leading to decreased concentration and difficulty in absorbing the material being studied (16).

Non-pharmacological approaches can also be employed to alleviate dysmenorrhea through the (Octavia & Sari, 2023) laxation (7). Benson relaxation is a technique that combines relaxation response techniques with individual belief systems or faith factors, focusing on the repeated verbalization of specific phrases, such as names of God or words that evoke a sense of calm, articulated in a rhythmic manner while adopting a posture of surrender (17). The effects of Benson relaxation influence the production of endorphins in the body. Endorphins are hormones that can diminish pain and abdominal cramps caused by uterine contractions; they function by inhibiting the production of prostaglandin hormones, generating positive energy, fostering feelings of happiness, and promoting bodily comfort, while also relaxing muscles to enhance blood circulation within the uterus (7). When Benson relaxation is practiced, the sympathetic nervous system predominates, allowing patients to feel more at ease and effectively manage mental symptoms such as anxiety, depression, fatigue, and pain (8). The advantages of Benson relaxation therapy over other therapies include its ease of implementation, low cost, simplicity, and absence of side effects (7). Engaging in Benson relaxation once daily for 10–15 minutes over a span of two days can assist in reducing and coping with both the physical and psychological conditions of patients (Anisah & Maliya, 2021). According to research conducted by Marinda et al. (2022), it is explained in their journal that Benson relaxation is effective in reducing dysmenorrhea, as the repetitive relaxation techniques induce comfort and muscle relaxation, thereby facilitating improved blood circulation in the uterus (8).

## Materials and Methods

This research is a quantitative study employing a quasi-experimental design with a non-equivalent control group approach. In this design, both the experimental and control groups are compared, although the samples are not randomly selected. In this study, the treatment group is provided with Benson relaxation, while the control group receives deep breathing relaxation. The aim of this research is to evaluate the effectiveness of Benson relaxation on anxiety and the intensity of dysmenorrhea. The quasi-experimental design utilizes a control-group pretest and posttest framework.

### Participants

The inclusion criteria consist of adolescents aged 15-18 years who experience anxiety during menstruation. The study is conducted at SMA Negeri Kota Semarang. A total of 80 respondents are involved, divided into two groups: 40 individuals receiving Benson relaxation therapy and 40 individuals in the control group practicing deep breathing relaxation. Sampling is conducted through multistage random sampling, with purposive sampling used for sample selection. In the treatment group, prior to data collection, the researcher provides guidance to participants on the steps for performing Benson relaxation and deep breathing relaxation.

### Instruments

The treatment group is instructed to practice Benson relaxation for two days, starting when respondents experience dysmenorrhea, with a duration of 10-15 minutes each day. Conversely, in the control group, the researcher instructs participants to engage in deep breathing relaxation for two days, also commencing when respondents feel dysmenorrhea, lasting for 10-15 minutes per day. Pre-test measurements are taken on the first day of menstruation when dysmenorrhea is experienced, while post-test measurements are conducted on the second day following the intervention.

### Data collection

The level of anxiety is assessed using the Depression Anxiety Stress Scale (DASS-42), while the intensity of

pain is measured with the Numeric Rating Scale (NRS). The standard operating procedure for Benson's relaxation therapy is based on Ivan (2020). The first step involves creating a calm and comfortable environment, encouraging the client to select a preferred location. Advise the client to assume a supine or seated position that they find most comfortable. Suggest that the client gently close their eyes without forcing them, allowing their body to relax and reduce muscle tension, starting from the feet and moving up to the face. Relax the head, neck, and shoulders by slowly rotating the head and gently lifting the shoulders. Instruct the client to begin breathing slowly and naturally, inhaling through the nose, holding the breath for 3 seconds, and then exhaling through the mouth while reciting 'Astaghfirullah' (according to their belief), calming the mind, then taking a deep breath and exhaling while saying 'Alhamdulillah' (according to their belief). For the deep breath, exhale while saying 'Allahu Akbar' (according to their belief) and continue this practice for 10-15 minutes (using phrases of faith according to their respective religions). The words spoken can include the name of Allah or His names from Asmaul Husna, as well as phrases for dhikr such as 'Alhamdulillah', 'Subhanallah', and 'Allahu Akbar' (for religions other than Islam, according to their beliefs). Instruct the client to conclude Benson's relaxation by keeping their eyes closed for 2 minutes, then advise them to open their eyes slowly.

### Statistical analysis

Univariate analysis was conducted on the characteristics of the respondents. Bivariate analysis was performed to assess the effectiveness of anxiety reduction and the intensity of menstrual pain using the Wilcoxon test. Data analysis was carried out using the SPSS program for data processing. This study employed descriptive analysis, which is presented in the form of frequency and percentage for each category. The ethical considerations of this research adhere to the principles of autonomy, justice, utility, and non-maleficence. This study has received ethical approval from the Unimus health department, with approval number 0232/KEPK/XII/2024.

## Results and Discussion

**Results:** The research results can be presented in

tables and descriptive descriptions of the characteristics of adolescents who experience menstrual pain as follows:

**Table 1.** Characteristics of respondents based on age, menarche, and menstrual pain is felt on what day (days) in the treatment and control groups at SMP Semarang in 2025 (n=80)

No	Sub Variabel	Group				p-value
		Control group		Control group		
		Mean	Min-Max (SD)	Mean	Min-Max (SD)	
1	Age (years)	15.83	15-17 (0.501)	16.08	15-17 (0.572)	0.988
2	Menarche (year)	11.78	10-14 (0.947)	12	10-14 (0.961)	0.954
3	Menstrual pain is felt on what day (days)	1.05	1-2 (0.221)	1.03	1-2 (0.158)	0.244

Source: Data processed in 2025

Based on Table 1, The average age of respondents in the treatment group is 15,83, with a minimum-maximum range of 15-17 (SD±0.501), while in the control group, it is 16.08, with a minimum-maximum range of 15-17 (SD±0.572). The average age of menarche in the treatment group is 11.78, with a

minimum-maximum range of 10-14 (SD±0.947), whereas in the control group, it is 1.05, with a minimum-maximum range of 1-2 (SD±0.221). The average menstrual pain experienced on which day for both the treatment and control groups is 1.03, with a minimum-maximum range of 1-2 (SD±0.158).

**Table 2.** Frequency distribution of respondents based on pre-test anxiety, post-test anxiety in the treatment group and control group at Semarang City in 2025 (n=80)

Indikator	Anxiety prior to the treatment				Anxiety following treatment			
	Treatment group		Control group		Treatment group		Control group	
	n	Presentase	n	Presentase	n	Presentase	n	Presentase
Normal anxiety	0	0%	0	0%	24	60%	10	25%
Mild anxiety	10	25%	10	25%	12	30%	14	35%
Anxiety is currently present.	11	27,5%	13	32,5%	2	5%	9	22,5%
Severe anxiety	13	32,5%	11	27,5%	2	5%	7	17,5%
The anxiety is quite severe.	6	15%	5	15,5%	0	0%	0	0%
Total	40	100%	40	100%	40	100%	40	100%

Source: Data processed in 2025

Based on Table 2. the categorization of characteristics based on anxiety prior to the intervention in the treatment group predominantly exhibited severe anxiety, with 13 individuals (32.5%). the control group also showed a majority with severe anxiety, totaling 11 individuals 27.5%). Following the

intervention, the categorization of characteristics based on anxiety in the treatment group revealed that most individuals experienced Normal anxiety, amounting to 24 individuals (60%), while the control group had a majority of 10 individuals (25%) experiencing Normal anxiety.

**Table 3.** Frequency distribution of respondents based on pre-test menstrual pain, post-test menstrual pain in the treatment group and control group at Semarang City in 2025 (n=80)

Sub variabelme	Menstrual pain prior to treatment.				Menstrual pain following treatment			
	Treatment group		Control group		Treatment group		Control group	
	n	Presentase	n	Presentase	n	Presentase	n	Presentase
There is no pain	0	0%	0	0%	11	27.5%	2	5%
Mild pain	16	40%	19	47.5%	23	57.5%	28	70%
moderate pain	22	55%	20	50%	6	15%	9	22.5%
severe pain	2	5%	1	2.5%	0	0%	1	2.5%
Total	40	100%	40	100%	40	100%	40	100%

Source: Data processed in 2025

Based on Table 4.3. Menstrual pain characteristics prior to the intervention, the treatment group primarily reported moderate pain, with 22 individuals (55%), whereas the control group mainly reported moderate pain, totaling 20 individuals

(50%). After the intervention, the categorization of characteristics based on menstrual pain in the treatment group showed that 11 people (27.5%) did not experience pain, while the control group did not experience pain, 2 people (5%).

**Table 4.** Anxiety and Intensity of menstrual pain before and after performing benson relaxation in the treatment group and deep breathing exercises in the control group in the Year 2025 (n=80)

Indikator	Treatment group		Control group	
	Mean	Min-Max (SD)	Mean	Min-Max (SD)
Pre-test anxiety	14.38	8-26 (5.280)	0,60069444	8-30 (5.484)
Post-test anxiety	0,29722222	0-19 (3.772)	0,41875	4-19 (3.787)
Menstrual pain pre-test	04.28	2-8 (1.377)	04.05	2-8 (1.449)
Menstrual pain post-test	0,10069444	0-5 (1.594)	0,14583333	0-7 (1.533)

Source: Data processed in 2025

Based on Table 4, The average anxiety level before and after the intervention was found to be 14.38 for the treatment group, with a range of 8 to 26 (SD±5.280), while the control group had an average of 13.85, with a range of 8 to 30 (SD±5.484). In terms of post-test anxiety levels, the treatment group recorded an average of 6.68, with a range of 0 to 19 (SD±3.772), whereas the control group had an average of 9.63, with a range of 4 to 19 (SD±3.787).

The average menstrual pain before and after the intervention was found to be 4.28 in the treatment group, with a range of 2 to 8 (SD±1.377), while the control group had an average of 4.05, with a range of 2 to 8 (SD±1.449). The average post-test menstrual pain in the treatment group was 1.85, with a range of 0 to 5 (SD±1.594), whereas the control group reported an average of 2.90, with a range of 0 to 7 (SD±1.533).

**Table 5.** Results of the study on the effects of benson relaxation on anxiety and menstrual pain intensity in the year 2025 (n=80)

Variabel	Treatment group			Control group			p-value
	Mean	Min-Max (SD)	Δ Mean	Mean	Min-Max (SD)	Δ Mean	
anxiety							
Pre-test	14.38	8-26 (5.280)	7.7	13.85	8-30 (5.484)	4.23	0,001
Post-test	6.68	0-19 (3.772)		9.63	4-19(3.787)		

Menstrual pain							
<i>Pre-test</i>	4.28	2-8 (1.377)	2,43	4.05	2-8 (1,449)	1,15	0,001
<i>Post-test</i>	1.85	0-5 (1.594)		2.90	0-7 (1,533)		

Source: Data processed in 2025

Based on Table 4.5 The results of the test comparing the effects between the treatment group and the control group were obtained, with each group consisting of 40 respondents. The average difference in pre-post values indicates that the treatment group experienced a greater reduction in anxiety, measuring 7.7, compared to the control group, which recorded 4.23. This suggests that Benson Relaxation are more effective in alleviating anxiety during menstrual pain. The Mann-Whitney U test yielded a p-value of 0.001 ( $<0.05$ ), indicating a statistically significant difference between the two groups. The average difference in pre-post scores for the treatment group showed a greater reduction in menstrual pain, measuring 2.43, compared to the control group, which recorded 1.15. This indicates that Benson Relaxation are more effective in alleviating menstrual pain. The Mann-Whitney U test yielded a p-value of 0.001 ( $<0.05$ ), indicating a statistically significant difference between the two groups.

## Discussion

This finding indicates that the study participants were within the late adolescent to young adult age range, a critical developmental stage associated with the onset of menstrual pain (dysmenorrhea) and menstrual-related anxiety. This period is particularly important because the hormonal and reproductive systems of adolescents are still undergoing dynamic physiological changes that may influence both pain perception and psychological responses during menstruation. The similarity in age distribution between the intervention and control groups also strengthens the internal validity of the study, as it minimizes the potential influence of age-related differences on the outcomes. Consequently, any observed differences in results can be more confidently attributed to the effects of Benson relaxation therapy rather than variations in age. Furthermore, adolescent girls aged 12–18 years commonly experience menstrual pain characterized by discomfort in the lower abdomen that may radiate

to the lower back. This condition is primarily associated with increased prostaglandin levels before and during menstruation, which stimulate uterine contractions and contribute to the development of dysmenorrhea (7).

The early onset of menarche (before the age of 12 years) has important implications for menstrual pain and anxiety among adolescents. Several studies have indicated that early menarche is associated with the biological immaturity of the reproductive organs. When menarche occurs at a younger age, the uterus and cervix may not yet be fully developed, which can lead to a heightened physiological response to hormonal fluctuations during menstruation. This condition may increase adolescents' vulnerability to experiencing menstrual discomfort and psychological distress. In addition, early menarche has been identified as a risk factor for primary dysmenorrhea. Previous studies have reported that adolescents who experience menarche before the age of 12 are more likely to suffer from severe or persistent menstrual pain. This condition is often associated with higher levels of prostaglandins and the limited capacity of the body to adapt to intense uterine contractions that occur during menstruation (18). Furthermore, from a psychological perspective, adolescents who experience menarche at an early age are more likely to develop feelings of worry, anxiety, and even fear, particularly when they have not received adequate reproductive health education or emotional support from their families and school environments. Adolescents with early menarche therefore represent an important target group for educational and intervention programs, as they require greater support in adapting to both the physiological and psychological changes associated with menstruation. The implementation of Benson relaxation therapy may assist adolescents in recognizing and managing the symptoms they experience, enhancing their self-confidence, and promoting positive coping strategies that can be applied during each menstrual cycle. Consequently, this study highlights the importance of considering

the age of menarche when developing strategies to manage menstrual pain and anxiety among adolescents, particularly in school-based settings. Such strategies can help ensure that promotive, preventive, and curative interventions are appropriately aligned with the developmental needs of adolescents. In addition, evidence suggests that women who experience menarche before the age of 12 years have a higher risk of developing primary dysmenorrhea compared with those whose menarche occurs after the age of 12 years (19). Early menarche ( $\leq 12$  years), when the reproductive organs may not yet be fully developed and the cervical canal may still be relatively narrow, can contribute to the occurrence of menstrual pain. This condition arises because the female reproductive system has not reached optimal physiological maturity, which may lead to more intense uterine contractions during menstruation (19). The results of the research from the analysis of respondent characteristics based on menstrual pain indicate that the average pain is felt on the first day in both the treatment group and the control group. Menstrual pain is characterized by discomfort in the lower abdomen that radiates to the waist, commonly experienced by adolescent girls, often occurring before or during menstruation (Boston, n.d. 2025). This condition typically begins 24 hours prior to the onset of menstrual bleeding and can last for 24 to 36 hours (21).

Family history is considered one of the primary risk factors for the occurrence of primary dysmenorrhea among adolescents, as it is influenced by genetic and anatomical factors inherited from mothers or female siblings. Previous studies have reported that adolescents with a family history of dysmenorrhea are approximately three times more likely to experience similar conditions compared with those without such a history. Anatomical factors, such as cervical stenosis, as well as hereditary hormonal patterns, may further increase the risk of more severe menstrual pain in adolescents with a familial predisposition to dysmenorrhea. The findings from the analysis of respondents' characteristics based on family history of menstrual pain showed that most participants in both the treatment and control groups reported no family history of menstrual pain, although a small proportion indicated the presence of such a history. A study conducted by Horman et al. (2021) also demonstrated a significant association

between a family history of menstrual pain and the occurrence of dysmenorrhea ( $p < 0.05$ ). Women with a family history of menstrual pain are therefore more likely to experience dysmenorrhea due to genetic factors that contribute to the development of this condition (12).

Benson relaxation therapy can reduce anxiety through several physiological and psychological mechanisms. This technique works by inhibiting the activity of the sympathetic nervous system, which typically increases during conditions of stress or anxiety. At the same time, Benson relaxation activates the parasympathetic nervous system, thereby promoting a relaxation response and restoring autonomic balance. In practice, this technique involves deep breathing exercises combined with the repetition of positive or calming words or affirmations. These processes help induce a state of relaxation, reduce the secretion of stress hormones such as cortisol, improve blood circulation, and stimulate the release of endorphins, which contribute to the reduction of anxiety and pain perception. Numerous studies in nursing and health sciences literature have also demonstrated the effectiveness of Benson relaxation as a non-pharmacological intervention for alleviating symptoms of anxiety and menstrual pain among adolescent girls, particularly in educational settings.

This inhibition reduces the body's oxygen consumption, allowing the muscles to relax and promoting a state of calmness and comfort. In Benson relaxation therapy, deep breathing exercises combined with the repetition of words or positive affirmation often aligned with an individual's personal belief help focus the mind, reduce intrusive thoughts, and relieve emotional tension (22). This process leads to a reduction in stress hormones, such as cortisol and adrenaline, while enhancing parasympathetic nervous system activity. As a result, vasodilation of blood vessels occurs, heart rate decreases, and blood pressure becomes more stable. In addition, Benson relaxation stimulates the release of endorphins and enkephalins, which possess analgesic and calming effects, thereby contributing to the reduction of anxiety without causing harmful side effect (23).

This finding aligns with the theory that Benson

relaxation is a straightforward relaxation technique that integrates elements of belief, prayer, or soothing words with regular breathing, thereby inducing a relaxation response within the body. This response triggers a decrease in the activity of the sympathetic nervous system, which tends to increase during anxiety, resulting in feelings of calmness and comfort (24). Physiologically, Benson relaxation functions by suppressing the production of stress hormones such as adrenaline and cortisol, as well as reducing the activity of the autonomic nervous system. This leads to a reduction in physiological signs of anxiety, such as rapid heartbeat, shallow breathing, and muscle tension. The relaxation effects provide a better emotional balance, particularly when dealing with menstrual pain, which often triggers anxiety in adolescents (25). The results of this study are consistent with previous research by Rahmawati (2020), which demonstrated that Benson relaxation is effective in lowering anxiety levels among students prior to examinations (26). Additional research by Raipure (2023) also supports the notion that this relaxation technique effectively reduces anxiety related to menstrual pain in adolescents, as it offers calming effects both physiologically and psychologically (27).

One of the factors that trigger menstrual pain is psychological factors such as anxiety. A person is considered anxious if they experience worry about uncertain outcomes, particularly in adolescents approaching menstruation (28). Adolescents who experience anxiety or stress will have an increased synthesis of prostaglandins accompanied by a decrease in estrogen or progesterone levels, leading to uterine muscle contractions, reduced uterine blood flow, and uterine ischemia, which results in menstrual pain (16). Adolescents who are unprepared to face menstruation will experience anxiety, resulting in a lowered pain threshold, ultimately making menstrual pain more severe with chronic and acute levels. Symptoms of anxiety can manifest as physical (somatic) disorders such as digestive issues, menstrual pain, and may appear alone or in conjunction with other emotional disorder symptoms (14). The majority of women experiencing menstrual pain will also suffer from nausea and vomiting, headaches,

increased irritability, or heightened emotional sensitivity, and fainting (3). One of the non-pharmacological approaches to managing anxiety is Benson relaxation (29).

The study indicates a significant reduction in anxiety levels during menstruation following the application of Benson relaxation techniques, which have a notable positive effect on anxiety management. The Benson relaxation therapy functions by inhibiting sympathetic nerve activity, which reduces the body's oxygen consumption, leading to muscle relaxation and a resultant feeling of calmness and comfort. The effects of Benson relaxation also influence the production of endorphins in the body (8). These findings align with the theory suggesting that the Benson relaxation process aids the body in achieving relaxation, thereby halting the production of adrenaline and other hormones necessary during stress (17). Furthermore, this study corroborates previous research conducted by Sari et al. (2022), which demonstrated that Benson relaxation therapy significantly affects the anxiety levels of pre-operative patients at RSUD Kab. Tangerang, evidenced by a decrease in anxiety of 1.55 before and after the application of Benson relaxation (7). With a p-value of 0.000 ( $<0.05$ ), it confirms the influence of Benson relaxation therapy on anxiety levels.

Furthermore, the application of Benson relaxation therapy is quite straightforward, requiring minimal costs, being simple, and presenting no side (8). The impact of Benson relaxation in this study is further supported by the consistency of the results, as reflected in the decrease in the standard deviation values from 5.280 to 3.772 following the implementation of the intervention. This finding indicates a more uniform reduction in anxiety levels among the respondents after receiving Benson relaxation therapy. Therefore, Benson relaxation may serve as an effective non-pharmacological approach for managing anxiety associated with menstrual pain in adolescent girls. The mechanism of this therapy involves inducing a relaxation response through controlled breathing, the repetition of affirmations or positive words, and mental calming techniques that help regulate emotional and physiological responses. This

process leads to a reduction in sympathetic nervous system activity, the release of natural endorphins, and a decrease in the production of stress hormones such as adrenaline (30)

This therapy functions by reducing the activity of the sympathetic nervous system, which is typically activated during conditions of stress and pain, thereby promoting improved blood circulation and relaxation of the uterine muscles that contract excessively due to the effects of prostaglandin hormones. In addition, Benson relaxation stimulates the release of endorphins, the body's natural analgesics, which contribute to the reduction of pain. The practice of deep breathing combined with the repetition of affirmations during relaxation helps redirect attention away from pain and alleviates anxiety that may intensify the perception of discomfort. Menstrual pain symptoms commonly experienced by adolescent girls during the menstrual cycle include cramping or stiffness in the lower abdominal region. This discomfort may also be accompanied by various emotional and physical symptoms, such as irritability, mood fluctuations, abdominal bloating, back pain, headaches, acne, fatigue, muscle tension, and, in some cases, depressive symptoms. These symptoms may occur both before and during menstruation, typically one day prior and one to two days during the menstrual period (31). Several factors contribute to the occurrence of menstrual pain, one of which is menarche. An early menarche age ( $\leq 12$  years) can result in underdeveloped reproductive organs and narrowing of the cervix, leading to pain during menstruation (19). Furthermore, women with a history of menstrual pain are more likely to experience it due to genetic factors (32). Research conducted by Horman et al. (2021) found a correlation between a family history of menstrual pain and the incidence of menstrual pain ( $P < 0.05$ ) (Nofrita Horman et al., 2021). One non-pharmacological therapy that can alleviate pain is Benson relaxation therapy. This relaxation technique serves as a treatment that significantly impacts the level of menstrual pain experienced by adolescent girls (29). A significant reduction in menstrual pain intensity following the implementation of deep breathing relaxation is attributed to the fact that during this Benson relaxation technique, the parasympathetic system

predominates, allowing patients to feel more comfortable and better manage mental symptoms such as anxiety, depression, fatigue, and pain (15). The Benson relaxation therapy was administered over a period of 2 days (once a day for 15-20 minutes) (34).

Benson relaxation therapy has been shown to be effective in reducing menstrual pain (dysmenorrhea) and anxiety among adolescent girls. The mechanism of this therapy involves inducing a relaxation response through regulated breathing, the repetition of affirmations or positive words, and mental calming techniques. These processes contribute to a decrease in sympathetic nervous system activity, stimulate the release of endogenous endorphins, and reduce the production of stress hormones such as adrenaline. In the context of menstrual pain, this technique helps alleviate excessive uterine muscle contractions and improves blood circulation while supporting the maintenance of the body's homeostatic balance. Consistent findings from several studies indicate a reduction in pain intensity from moderate to mild levels, and in some cases complete relief, following the regular practice of Benson relaxation exercises. The reduction in pain is attributed to the effects of endogenous analgesia and the increased levels of endorphins that diminish pain perception and suppress the production of prostaglandins (35).

The effects of Benson relaxation influence the production of endorphins in the body. Endorphins are hormones that can alleviate pain and abdominal cramps caused by uterine contractions. The mechanism of endorphins involves suppressing the production of prostaglandin hormones while providing positive energy, fostering feelings of happiness, and promoting bodily comfort, as well as relaxing the muscles, which enhances blood circulation within the uterus (15).

This is supported by research conducted by Marinda et al. (2022), which indicates that prior to the application of Benson relaxation therapy, the level of primary dysmenorrhea among female students was categorized as mild (18.3%) to moderate (31.7%) (8). Following the

implementation of Benson relaxation therapy, the levels of primary menstrual pain among the students were reported as no pain (14.6%), mild pain (32.9%), and moderate pain (2.4%). Additionally, findings from Agustinia (2020) corroborate this, revealing a difference in the intensity of menstrual pain post-Benson relaxation within the intervention group (36). The quantitative data analysis from tests conducted before and after Benson relaxation yielded significant results ( $p < 0.05$ ), indicating that Benson relaxation has a beneficial effect in alleviating menstrual pain among female university students (36).

The influence of Benson relaxation in this study is supported by the consistency of results indicated by the standard deviation values of pain intensity, which increased from 1.377 to 1.594 after the application of Benson relaxation (34). This suggests that there is a uniform distribution of data regarding menstrual pain intensity among the respondents. It can be concluded that Benson relaxation may serve as a non-pharmacological management approach for menstrual pain management in adolescent girls, as it is easy to implement, cost-effective, straightforward, and free from side effects (8). Regular practice of the Benson relaxation technique is recommended as a simple and effective intervention for reducing the intensity of menstrual pain and anxiety among adolescents, while also improving quality of life and supporting psychological adaptation during menstruation.

## Conclusion

The Wilcoxon test yielded a Z value of  $-5.324$  and a p-value of  $0.001$  ( $< 0.05$ ), indicating a statistically significant difference in anxiety levels before and after the implementation of Benson therapy. The average pain intensity also decreased from 4.28 (moderate pain) to 1.85 (mild pain). Similarly, the Wilcoxon test produced a Z value of  $-5.555$  with a p-value of  $0.001$  ( $< 0.05$ ), demonstrating a statistically significant difference in menstrual pain intensity before and after the Benson relaxation intervention.

During the relaxation response, parasympathetic nervous system activity becomes dominant, resulting in increased physical comfort and improved

regulation of psychological symptoms such as anxiety, depression, fatigue, and pain. Benson relaxation can therefore be considered a simple, cost-effective, and side-effect-free non-pharmacological intervention for reducing anxiety and menstrual pain among adolescent girls. Regular practice of this technique, combined with reproductive health education in both school and family environments, is recommended to support adolescents' psychological adaptation and improve their quality of life during menstruation.

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